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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/002,175	12/05/2001	Neal M. Bowen	M4065.0493/P493	2267

24998 7590 05/20/2004

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EXAMINER
EDMONDSON, LYNNE RENEE

ART UNIT	PAPER NUMBER
1725	

DATE MAILED: 05/20/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/002,175	BOWEN, NEAL M.	
	Examiner	Art Unit	
	Lynne Edmondson	1725	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 March 2004* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-8,10-46 and 48-57* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *6-8 and 18-41* is/are allowed.

6)☒ Claim(s) *1-4,10-17,42-46 and 48-57* is/are rejected.

7)☒ Claim(s) *5* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *21 February 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-4 and 10-17 rejected under 35 U.S.C. 102(e) as being anticipated by Mess et al. (US 2003/0137042 A1).

Mess teaches a wire bonded structure comprising a first bonding area (58) on a substrate, a second bonding area (54A) on a lower IC chip (paragraph 3) and a third bonding area (54B) on an upper chip wherein lines drawn between endpoints of the first and second wire bond are not parallel. Angles are formed in the vertical and horizontal planes (figures 13 and 14). Bumps (ball bonds) are formed on at least one pad (paragraphs 57-60).

3. Claims 14-17 rejected under 35 U.S.C. 102(e) as being anticipated by O'Connor et al. (USPN 6476506 B1).

O'Connor teaches a wire bonded structure comprising a first bonding area (118) on a substrate, a second bonding area (112) on a lower chip and a third bonding area (110) on an upper chip wherein lines drawn between endpoints of the first and second wire bond are not parallel. Angles are formed in the vertical and horizontal planes. Bumps (ball bonds) are formed on at least one pad (figures 4 and 6 and col 5 line 44 – col 6 line 19).

4. Claims 42-46 and 48-57 are rejected under 35 U.S.C. 102(b) as being anticipated by Biggs et al. (USPN 5702049).

Biggs teaches a wire bonding apparatus (figure 18) comprising a wire feeding device (capillary, 109 or 209) and a mechanism for moving and operating the device for forming multiple bonds (col 7 lines 1-33) via a controlled drive unit (motor). The control unit comprises a computer, software (program, col 13 line 58 – col 14 line 16) and measuring means (camera, col 3 line 56 – col 4 line 23) for positioning the capillary accordingly (col 7 lines 34-61) and is capable of forming bonds at an angle to the horizontal (figure 6) and to the vertical (figures 3A and 19). See also column 11 lines 20-44 and Biggs claims 4-8.

5. Claims 42-46 and 48-57 are rejected under 35 U.S.C. 102(b) as being anticipated by Fujishima (USPN 6148505).

Fujishima teaches a wire bonding apparatus (figure 1) comprising a wire feeding device (capillary, 2) and a mechanism for moving and operating the device for forming

multiple bonds via a controlled drive unit (col 3 line 50 – col 4 line 11). The control unit comprises a computer and software (program, col 9 lines 37-45) for measuring (determining) and positioning the capillary accordingly and is capable of forming bonds at an angle (col 5 lines 18-55). See also Fujishima claims 1-6.

6. Claims 42-46 and 48-57 are rejected under 35 U.S.C. 102(b) as being anticipated by Nagaoka et al. (USPN 5292050).

Nagaoka teaches a wire bonding apparatus comprising a wire feeding device (capillary, col 3 lines 55-68) and a mechanism for moving and operating the device for forming multiple bonds via a computer program controlled drive unit (figure 3). The control unit comprises a computer and software (program, col 2 lines 8-68 and col 4 lines 37-68) for measuring (monitoring) and positioning the capillary accordingly and is capable of forming bonds at an angle (figures 4-7, col 5 line 45 – col 6 line 32). See also Nagaoka claims 1-8.

7. Claims 42-46 and 48-57 are rejected under 35 U.S.C. 102(e) as being anticipated by Yin et al. (US 2003/0049882 A1).

Yin teaches a wire bonded structure (figures 4 and 6) comprising a first wire bonding area (83), a second bonding area (24) and a third bonding area (52) provided on three stacked components (20, 80, 30); a first wire bond between the first and second bonding areas (90), a second wire bond (76) between the second and third bonding areas and at least one of the bonds (76) at the second area being on top of the

other bond (figure 6). The components are integrated circuit chips (paragraphs 6 and 19-20). A ball bond is present at the end of the first and second bonds (72, 92). As shown in figure 6, an imaginary line drawn along the longitudinal line on the second bond is not parallel to the same such line drawn on the first bond. A wire bonding apparatus is taught comprising a wire feeding device (capillary) and a mechanism for moving and operating the device for forming multiple bonds via a computer programmed, controlled drive unit. The apparatus is capable of forming bonds at an angle (figure 3 and paragraphs 2, 4, 5 and 7). See also Yin claims 1, 7, 15, 18, 24, 29-31, 38, 48 and 51.

Response to Arguments

8. Applicant's arguments with respect to claims 1-8, 10-23 and 10-41 have been considered but are moot in view of the new ground(s) of rejection.

9. Regarding applicant's argument that Biggs, Fujishima, Nagaoka and Yin do not teach an apparatus "which forms a first wire bond...[and] a second wire bond..." in a particular sequence and configuration and that because the device does not form the bumps it is not capable of forming the bumps, it is noted that the claims in question are apparatus claims rather than method claims.

10. In response to applicant's argument that the device does not form a first conductive bump on a first conductive surface and first ball bond, a recitation of the

intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In a claim drawn to a process of making, the intended use must result in a manipulative difference as compared to the prior art. See *In re Casey*, 152 USPQ 235 (CCPA 1967) and *In re Otto*, 136 USPQ 458, 459 (CCPA 1963).

It is noted that the devices have the claimed structures, a wire feeding device typically a capillary, a mechanism for moving and operating the device (capillary), which is movable in several directions and a controller for controlling a wire bonding device such that bumps can be formed as disclosed in col 9 lines 37-45. The device is capable of forming ball bonds and bumps at various angles.

11. Therefore the 102 rejection of claims 42-46 and 48-57 as anticipated by Biggs stands.

12. Therefore the 102 rejection of claims 42-46 and 48-57 as anticipated by Fujishima stands.

13. Therefore the 102 rejection of claims 42-46 and 48-57 as anticipated by Nagaoka stands.

14. Therefore the 102 rejection of claims 42-46 and 48-57 as anticipated by Yin stands.

Allowable Subject Matter

15. Claim 5 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

16. The following is a statement of reasons for the indication of allowable subject matter: The closest prior art teaches the invention essentially as claimed but only teaches two of the three components in the same plane. See Heo (USPN 6555917 B1).

17. Claims 6-8 and 18-41 are allowed.

Conclusion

18. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Masumoto et al. (US 2003/0205725, apparatus as claimed), Lee (USPN 6561411 B2, stacked bump (ball bond) and wire bond), Sterczyk (USPN 5269452, apparatus, program, control, angles) and Huddleston et al. (USPN 5498767, apparatus, capillary, computer, program, measuring means).

19. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lynne Edmondson whose telephone number is (571) 272-1172. The examiner can normally be reached on Monday through Thursday from 6:30 a.m. to 5 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Dunn can be reached on (571) 272-1171. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Lynne Edmondson
Primary Examiner
Art Unit 1725

5/6/08

LRE